

Remarks

The Office Action dated September 1, 2005 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-8, 10-11, 13, and 15-20 are pending in this application. Claims 9, 12, and 14 have been canceled. Claims 1-8, 10-11, 13, and 15-20 are rejected.

In accordance with 37 C.F.R. 1.136(a), a two month extension of time is submitted herewith to extend the due date of the response to the Office Action dated September 1, 2005, for the above-identified patent application from December 1, 2005, through and including February 1, 2006. In accordance with 37 C.F.R. 1.17(a), authorization to charge a deposit account in the amount of \$450.00 to cover this extension of time request also is submitted herewith.

The objection to the drawings under 37 CFR 1.48(p)(4) is respectfully traversed.

Applicants submit that reference character 150 is used to designate a support beam and reference character 164 is used to designate a protrusion that extends from the top of the beam 150. Applicants submit that the Examiner approved the amendment to Figure 4 adding reference character 164 in the Office Action dated December 23, 2004, at page 2. Also, Applicants submit herewith a new Figure 8, for approval, that better illustrates the protrusion 164 extending from the top of beam 150.

For the reasons set forth above, Applicants respectfully request that the objection to the drawings under 37 CFR .48(p)(4) be withdrawn.

The objection to the drawings under 37 CFR 1.83(a) is respectfully traversed.

Applicants submit herewith a new Figure 8, for approval, that illustrates support beam 150 received in groove 122.

An amended Figure 2 is submitted herewith, for approval, showing opening 142.

Applicants respectfully submit that the drawing amendment submitted November 16, 2004 did not introduce new matter. The subject matter relating to a protrusion extending along the length of the support beam 150 was in the originally filed application (see paragraph [0026] and Claim 5) and the addition of reference label 164 to Figure 4 to illustrate the protrusion is not an addition of new matter. Applicants further submit that the Examiner accepted the drawing amendment submitted November 16, 2004 in an Office Action dated December 23, 2004, page 2. Also, Applicants have submitted herewith a new Figure 8 which better illustrates the protrusion 164 extending from the top of beam 150.

For the reasons set forth above, Applicants respectfully request that the objection to the drawings under 37 CFR 1.83(a) be withdrawn.

The objection to the specification under 35 U.S.C. 132(a) is respectfully traversed.

Applicants submit that the amendment filed November 16, 2004 did not introduce new matter to the specification. The subject matter relating to a protrusion extending along the length of the support beam 150 was in the originally filed application (see paragraph [0026] and Claim 5) and the addition of reference label 164 to Figure 4 and to paragraph [0026] to illustrate the protrusion is not an addition of new matter. Further, the amendments to paragraph [0026] adding reference character 164 was approved at page 2 of the Office Action dated December 23, 2004.

For the reasons set forth above, Applicants respectfully request that the objection to the specification under 35 U.S.C. 132(a) be withdrawn.

The rejection of Claim 5 under 35 U.S.C. § 112, first paragraph, is respectfully traversed.

Applicants respectfully submit that the subject matter of Claim 5, the protrusion extending from the support beam is described in sufficient detail in paragraph [0026] for one skilled in the art to make and use the invention. Applicants respectfully submit that one skilled in the art would understand what is meant by a protrusion extending along the length of the support beam and that the protrusion is receivable within the at least one groove as recited in originally filed Claim 5. The Federal Circuit has held that "Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners, lest every patent be required to be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field." *Verve LLC v. Crane Cams Inc.*, 65 USPQ2d 1051, 1053-1054 (Fed Cir. 2002).

For the reasons set forth above, Applicants respectfully request that the Section 112, first paragraph, rejection of Claim 5 be withdrawn.

The rejection of Claims 1-8, 10, 11, 13, and 15-20 under 35 U.S.C. § 112, first paragraph, is respectfully traversed.

Applicants respectfully submit that the subject matter in the claims is described in the specification to enable one skilled in the art to make and use the invention. Figure 2 has been amended to better show opening 142 which permits the grooves in the support plates to receive the support beams. Also, Applicants submit that one skilled in the art would know how thick the support plates would need to be to function in a nuclear reactor and to support the fuel assemblies. Further, Applicants submit that the specification does describe that the support beams are received in the grooves of the support plates (see paragraph [0026], first sentence).

Claim 4 has been amended to recite "The apparatus according to Claim 1 wherein each said support plate is removable from above said core support." Applicants respectfully submit that one skilled in the art would understand how to remove a support plate from the core of the nuclear reactor.

As explained above, the protrusion extending from the support beam is described in sufficient detail in paragraph [0026] for one skilled in the art to make and use the invention. Applicants respectfully submit that one skilled in the art would understand what is meant by a protrusion extending along the length of the support beam and that the protrusion is receivable within the at least one groove as recited in originally filed Claim 5.

Further, the Federal Circuit has held that "Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners, lest every patent be required to be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field." *Verve LLC v. Crane Cams Inc.*, 65 USPQ2d 1051, 1053-1054 (Fed Cir. 2002).

For the reasons set forth above, Applicants respectfully request that the Section 112, first paragraph, rejection of Claims 1-8, 10, 11, 13, and 15-20 be withdrawn.

The rejection of Claims 1-8, 10, 11, 13, and 15-20 under 35 U.S.C. § 112, second paragraph, is respectfully traversed.

Claims 1 and 13 have been amended to recite "a plurality of removable support plates disposed on said plurality of support beams, each said removable support plate comprising a top surface and an opposing bottom surface, and at least one groove in said bottom surface, each said

groove sized to engage one of said support beams where at least a portion of said beam is positioned in said groove."

Claim 4 has been amended to recite "The apparatus according to Claim 1 wherein each said support plate is removable from above said core support." Applicants respectfully submit Claim 4 is not vague and indefinite and that one skilled in the art would understand how to remove a support plate from the core of the nuclear reactor.

Claim 5 has been amended to recite "each said support beam comprises a protrusion extending from a top surface of said beam along a length of said beam, said protrusion receivable within said at least one groove." Applicants respectfully submit Claim 5 is not vague and indefinite and that one skilled in the art would understand what is meant by a protrusion extending along the length of the support beam and that the protrusion is receivable within the at least one groove.

Claim 19 has been amended to recite "each said internal flow passage comprises a first channel and a second channel, said first and second channels located within said at least one removable support block." Applicants submit that there is proper antecedent basis for a first channel and a second channel. See paragraph [0029] and Figure 7. Further, Applicants submit that all the terms in the claims have a proper antecedent basis.

For the reasons set forth above, Applicants respectfully request that the Section 112, second paragraph, rejection of Claims 1-8, 10, 11, 13, and 15-20 be withdrawn.

The rejection of Claims 1-6 and 13 and 15 under 35 U.S.C. § 102(b) as being anticipated by Anthony (U.S. Patent No. 4,127,445) is respectfully traversed.

Anthony describes a lower core support structure (18) for a nuclear reactor (10). The support structure includes a plurality of support beams (19 and 21) forming a grid network of support beams. Metal pads (22) and alignment pins (23) are welded to the upper surface of the support beams. Fuel assemblies (16) are supported and aligned by the pads and pins. A portion of the fuel assemblies, namely a lower end fitting (38) rests on the pads. Specifically, alignment posts (60) extend downward from a lower end plate (54), and a bottom surface of the alignment posts rest on the top surface of the pads. Notably, the alignment posts do not contact the support beams.

Claim 1 recites an apparatus for supporting fuel assemblies in a reactor pressure vessel including a core, wherein the apparatus includes "a plurality of support beams...a plurality of removable support plates disposed on said plurality of support beams, each said removable support plate comprising a top surface and an opposing bottom surface, and at least one groove in said bottom surface, each said groove sized to engage one of said support beams where at least a portion of said beam is positioned in said groove."

Anthony does not describe nor suggest an apparatus for supporting fuel assemblies in a reactor pressure vessel as recited in Claim 1. Particularly, Anthony does not describe nor suggest an apparatus having a removable support plate including at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. Rather, Anthony describes a support structure having a plurality of support beams, metal pads, and alignment pins, where the fuel assemblies are supported and aligned by the pads and pins. Anthony does not describe a removable support plate. The Office Action dated 12/23/04 suggests that reference number refers to a support plate.

However, Figure 3 and Col. 4, lines 26-46, clearly show and describe that lower end plate is part of a fuel assembly and not part of a core support apparatus. Further, alignment posts extend downward from the lower end plate of the fuel assemblies and a bottom surface of the alignment posts rest on a top surface of the pads. Anthony does not describe nor suggest a support plate groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. In fact, the fuel assemblies described in Anthony do not even contact the support beams. Rather, and in contrast to the present invention, the fuel assemblies rest upon the metal pads.

Additionally, Applicants respectfully traverse the suggestion in the Office Action, dated 12/23/04, at page 8, that Anthony describes a removable support plate including at least one groove configured to mate with a support beam. Specifically, the Office Action recites "each said removable plate (54) comprising at least one groove (4 grooves labeled (62)) configured to mate with one of said plurality of support beams (via beam/protrusion combination 19, 21, 22, and 23)." Applicants respectfully submit that the depressions (62) described in Anthony are NOT configured to mate nor are they mating with the support beams as suggested in the Office Action. Rather, each cylindrical depression merely receives and engages an upwardly extending alignment pin (23). *See Col. 4, lines 34-37.* Notably, Anthony does not describe or suggest that the cylindrical depressions engage the support beams. Accordingly, for the reasons set forth above, Applicants submit that Claim 1 is patentable over Anthony.

Claims 2-6 depend from independent Claim 1. When the recitations of Claims 2-6 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that dependent Claims 2-6 likewise are patentable over Anthony.

Claim 13 recites a nuclear reactor including "a reactor pressure vessel...a reactor core located inside said reactor pressure vessel...a core plate located inside said reactor pressure vessel, said core plate including a plurality of support beams; and a plurality of removable support plates disposed on said plurality of support beams, each said removable support plate comprising a top surface and an opposing bottom surface, and at least one groove in said bottom surface, each said groove sized to engage one of said support beams where at least a portion of said beam is positioned in said groove."

Anthony does not describe nor suggest a nuclear reactor as recited in Claim 13. More specifically, Anthony does not describe nor suggest a nuclear reactor having a removable support plate including at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. Rather, Anthony describes a support structure having a plurality of support beams, metal pads, and alignment pins, where the fuel assemblies are supported and aligned by the pads and pins. Anthony does not describe a removable support plate. The Office Action dated 12/23/04 suggests that reference number 54 refers to a support plate. However, Figure 3 and Col. 4, lines 26-46, clearly show and describe that lower end plate is part of a fuel assembly and not part of a core support apparatus. Further, alignment posts extend downward from the lower end plate of the fuel assemblies and a bottom surface of the alignment posts rest on a top surface of the pads. Anthony does not describe nor suggest a support plate groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. In fact, the fuel assemblies described in Anthony do not even contact the support beams. Rather, and in contrast

to the present invention, the fuel assemblies rest upon the metal pads. Accordingly, for the reasons set forth above, Applicants submit that Claim 13 is patentable over Anthony.

Claim 15 depends from independent Claim 13. When the recitations of Claim 15 are considered in combination with the recitations of Claim 13, Applicants respectfully submit that dependent Claim 15 likewise is patentable over Anthony.

For the reasons set forth above, Applicants respectfully request that the Section 102(b) rejection of Claims 1-6 and 13 and 15 be withdrawn.

The rejection of Claims 1-6 under 35 U.S.C. § 102(b) as being anticipated by Rinderer (U.S. Patent No. 5,782,439) is respectfully traversed.

Rinderer describes a support system for transmission lines that includes a plurality of rail sections attached to the top surface of a hub. Rinderer does not describe nor suggest any type of apparatus that can be used in a nuclear reactor core. The suggestion at pages 9-10 of the present Office Action that apparatus described by Rinderer is inherently capable of use in supporting fuel assemblies in a reactor pressure vessel including a core cannot be supported by the specification of the Rinderer patent. For an apparatus to be inherently capable of doing something it must actually be able to do the task. Rinderer describes at Col. 3, lines 5-9, that the hub member 50, which the Office Action suggests is a removable core support plate, has a thickness of **0.125 inches**. Anybody, skilled in the art, would understand that the hub member 50 having a thickness of 0.125 inches is **incapable** of use in supporting fuel assemblies in a reactor pressure vessel.

Rinderer does not describe nor suggest an apparatus for supporting fuel assemblies in a reactor pressure vessel as recited in Claim 1. Particularly, Rinderer does not describe nor suggest

an apparatus having a removable support plate including at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. Rather Rinderer describes a support system for transmission lines that includes a plurality of rail sections attached to the top surface of a hub member. The hub 50 does not include a plurality of grooves on its bottom surface that are sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. Rather, the rails 14 are attached to the upper side of the hub. Particularly, the rails 14 are attached to the upper surface of a flange 64 that extends around the perimeter of the hub. accordingly, Applicants submit that Claims 1-6 are patentable over Rinderer.

Claims 2-6 depend from independent Claim 1. When the recitations of Claims 2-6 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that dependent Claims 2-6 likewise are patentable over Rinderer.

For the reasons set forth above, Applicants respectfully request that the Section 102(b) rejection of Claims 1-6 be withdrawn.

The rejection of Claims 1-8, 10, 11, 13 and 15-18 under 35 U.S.C. § 102(a) as being anticipated by Challberg (U.S. Patent No. 6,813,327) is respectfully traversed.

Applicant respectfully submits that the Section 102 rejection of the presently pending claims is not a proper rejection. The Federal Circuit has opined that to anticipate a claim, **a single source must contain all of the elements of the claim.** See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F2.d 137, 1379, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986). Also, **missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of**

another reference. See *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984).

Applicants submit that Challberg does not describe nor suggest a plurality of support plates disposed on the plurality of support beams. Challberg describes only one core plate. Further, Challberg does not describe nor suggest a removable support plate that includes at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. The core plate of Challberg does not include any grooves. The suggestion at page 12 of the present Office Action that "at least one groove reads on grooves in the surface of the plate created during the manufacturing and surface process" does not support a Section 102 rejection. As explained above, the Federal Circuit has ruled that that to anticipate a claim a single source must contain all of the elements of the claim and any missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. Also, Applicants submit that any finishing scratches present on the bottom surface of a support plate would not be sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. Accordingly, Applicants submit that independent Claims 1 and 13 are patentable over Challberg.

Claims 2-8 and 10-11 depend from independent Claim 1 and Claim 15-18 depend from independent Claim 13. When the recitations of Claims 2-6, and 10-11, and Claims 15-18 are considered in combination with the recitations of Claims 1 and 13 respectively, Applicants respectfully submit that dependent Claims 2-8, 10-11, and 15-18 likewise are patentable over Challberg.

For the reasons set forth above, Applicants respectfully request that the Section 102(a) rejection of Claims 1-8, 10, 11, 13 and 15-18 be withdrawn.

The rejection of Claims 1-8, 10, 11, 13 and 15-18 under 35 U.S.C. § 103(a) as being unpatentable over Challberg (U.S. Patent No. 6,813,327) in view of Sodergard (U.S. Patent No. 3,650,895) is respectfully traversed.

As explained above, Challberg does not describe nor suggest an apparatus for supporting fuel assemblies in a reactor pressure vessel as recited in Claim 1 or a nuclear reactor as recited in Claim 13. Particularly, Challberg does not describe nor suggest a plurality of removable support plates where each removable support plate includes at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove.

Sodergard describes exchangeable control rod guide tubes for a nuclear reactor. The guide tubes are supported by the bottom of the reactor pressure vessel and carry square support blocks at the upper end of the guide tubes. The support blocks are arranged in an edge to edge relationship to form an even bottom for the reactor core. Sodergard does not describe nor suggest that the support blocks include at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove.

Challberg and Sodergard, alone or in combination, do not describe nor suggest an apparatus for supporting fuel assemblies in a reactor pressure vessel as recited in Claim 1 or a nuclear reactor as recited in Claim 13. Particularly, Challberg and Sodergard, alone or in combination, do not describe nor suggest a plurality of removable support plates where each

removable support plate includes at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. Rather, Challberg describes one large core plate that does not include at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. Also, Sodergard describes a plurality of core support blocks that are supported by the control rod guide tubes and that do not include at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. Accordingly, combining the teachings of Challberg with the teachings of Sodergard does not produce or suggest a plurality of removable support plates where each removable support plate includes at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. For the reasons set forth above, Applicants submit that independent Claims 1 and 13 are patentable over Challberg and Sodergard, alone or in combination.

Claims 2-8 and 10-11 depend from independent Claim 1 and Claim 15-18 depend from independent Claim 13. When the recitations of Claims 2-6, and 10-11, and Claims 15-18 are considered in combination with the recitations of Claims 1 and 13 respectively, Applicants respectfully submit that dependent Claims 2-8, 10-11, and 15-18 likewise are patentable over Challberg and Sodergard, alone or in combination.

For the reasons set forth above, Applicants respectfully request that the Section 103(a) rejection of Claims 1-8, 10, 11, 13 and 15-18 be withdrawn.

The rejection of Claims 19 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Challberg (U.S. Patent No. 6,813,327) in view of Sodergard (U.S. Patent No. 3,650,895) and further in view of Dalke et al. (U.S. Patent No. 5,519,746) is respectfully traversed.

As explained above, Challberg and Sodergard, alone or in combination, do not describe nor suggest a nuclear reactor as recited in Claim 13. Particularly, Challberg and Sodergard, alone or in combination, do not describe nor suggest a plurality of removable support plates where each removable support plate includes at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove.

Dalke et al. is cited for teaching an inter-bundle support plate 140. Dalke et al. is not cited for and do not teach a plurality of removable support plates where each removable support plate includes at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. As explained above, Challberg and Sodergard, alone or in combination, do not describe nor suggest such a structure.

Challberg, Sodergard, and Dalke et al., alone or in combination, do not describe nor suggest a nuclear reactor as recited in Claim 13. Particularly, Challberg, Sodergard, and Dalke et al., alone or in combination, do not describe nor suggest a plurality of removable support plates where each removable support plate includes at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove. Accordingly, Applicants submit that independent Claim 13 is patentable over Challberg, Sodergard, and Dalke et al., alone or in combination.

Claims 19 and 20 depend from independent Claim 13. When the recitations of Claims 19 and 20 are considered in combination with the recitations of Claim 13, Applicants respectfully submit that dependent Claims 19 and 20 likewise are patentable over Challberg, Sodergard, and Dalke et al., alone or in combination.

For the reasons set forth above, Applicants respectfully request that the Section 103(a) rejection of Claims 19 and 20 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,



Michael Tersillo
Registration No. 42,180
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070